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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/695,645

10/24/2000

John Stevens Merriam JR.

Merriam 3

2071

7590

09/20/2004

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EXAMINER

CHANG, EDITH M

ART UNIT

PAPER NUMBER

2637

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/695,645

Applicant(s)

MERRIAM, JOHN STEVENS

Examiner

Edith M Chang

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Move the Related applications: from page 3 to page 2 before the Background of Invention as the Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.

Add serial number 09/695,647 for “APPARATUS AND METHOD FOR MULTI-CHANNEL COMMUNICATIONS SYSTEM”, and serial number 09/695,536 for “APPARATUS AND METHOD FOR MULTI-CHANNEL RECEIVER”.

Claim Objections

2. Claims 1-22 are objected to because of the following informalities:

Claim 1, line 4: “the front end” is suggested changing to “the receiver front end”; line 5: “data stream data stream” is suggested changing to “data stream”; line 7: “the component channel signals” is suggested changing to “component channel signals”.

Claim 4, line 1: “DOCSIS” is suggested spelling out the acronym as it appears in the claim the first time.

Claim 12, line 2: “non-overlapping,” is suggested changing to “non-overlapping channels”.

Claim 13, line 1: “of down-converting” is suggested changing to “converting”.

Claim 14, line 3: “a decimator receiving” is suggested changing to “receiving”.

Claim 15, line 1 and claims 16 & 17, lines 1-2: "the down-converter and decimator down-convert and decimate" is suggested changing to "converting and decimating".

Claim 18, line 1: "down-converting" is suggested changing to "converting".

Claims 2-3, 5-11 and 19-22 directly or indirectly depend on objected independent claims 1 and 12.

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, line 2: "the component channel" lacks antecedent basis.

Claim 3, line 1: "a decimator" is not clearly indicated whether it is another decimator than the "a decimator" in claim 1; line 2: "the baseband channel signals"; line 3: "the corresponding baseband channel signal" and line 4: "the respective channel" lack antecedent basis to clearly indicate what the relation of these signal(s) and channel of the invention in the claim.

Claims 5 & 6, line 1: "the front end" lacks antecedent basis.

Claim 7, line 3 and claims 8 & 9, line 2: "the frequency band" lacks antecedent basis, and is not clear that it is the "predetermined maximum frequency band" in claim 1 or is other frequency band.

Art Unit: 2637

Claim 11, line 2: "the full-band analog signal" and "the entire band" lack antecedent basis.

Claim 12, line 8: "the component channel signals" lacks antecedent basis.

Claim 13, line 1: "the component channel signals" lacks antecedent basis.

Claim 14, line 4: "the corresponding baseband channel signal" and lines 5-6: "the respective channel" lacks antecedent.

Claim 18, line 4; Claim 19 lines 2-3: "the frequency band" lack antecedent basis.

Claim 20, line 2: "decimators decimating" does not understood that how the decimating of the decimators relate to the decimation of a decimator in the claim 12 and "the frequency band" lacks antecedent basis.

Claim 21, line 2: "decimators decimating" does not understood that how the decimating of the decimators relate to the decimation of a decimator in the claim 12 and line 3: "the baseband channel" lacks antecedent basis.

Claim 22, lines 2-3: "the full-band analog signal"; line 4: "the entire band"; and lines 6-7: "the down-converters and decimators" lack antecedent basis.

Claims 4, 10, 15-17 and 19 directly or indirectly depend on the rejected independent claims 2, 7 and 12.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2637

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 11-14 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Womack et al. (US Patent 5,982,819) in view of Ivo et al. (DSP and digital down conversion Proceeding of the Radioelectroniak 99).

Regarding **claims 1 & 12**, In FIG.4 Womack et al. discloses the element 401, the receiver front end in the messaging receiver 400, comprising the element 411, the digital converter performing down-converting and decimating as stated in column 5 lines 26-28 and lines 35-40. The digital converter takes in over sampled wideband data from the A/D element 409 (analog to digital converter) that the sample rate is at lest twice the frequency of the highest frequency in the wideband data according to the well known Nyquist criteria.

With respect to the band of the sampled data, in FIG.1, the messaging receiver 400 (located at the base station 115 or 117, column 4 lines 17-18) receives signals from channel 103 (or called outbound/forward channel) and channel 105 (inbound/reverse channel) having different frequency bands (column 2 lines 25-30 & column 5 lines 15-21). In column 5 lines 35-45, each down-converter selects a channel (the narrow band) out of the wideband, hence each channel of the digital converter is independent and non-overlapping.

However Womack et al. does not explicitly specify the detail structure of the digital converter performing the down-converting and decimating, but suggests the digital converter is an AD-6620 (column 5 lines 25-30). Ivo teaches the architecture of the AD-6620 in Fig.1. In Fig.1 the AD-6620 comprises the down-converter, DQD (digital quadrature detector) with LO (local oscillator), to accept and down-convert the sampled data; and the DF (decimation filter) to decimate the converted signal from the DQD. As Womack et al. prefers/suggests the AD-6620

for the digital converter, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Womack et al.'s digital converter replaced by the AD-6620 for the purpose to use the best IC for the digital down conversion (Introduction of Ivo).

Regarding **claims 2 & 13**, In FIG. 1, with the modified Womack et al.'s digital converter with Ivo et al.'s teaching, the front end (element 401) discloses a plurality of down-converters (elements 411) to down convert component channels in parallel.

Regarding **claims 3 & 14**, the modified Womack et al.'s digital converter with Ivo et al.'s teaching discloses a decimator (DF in Fig. 1 of Ivo) receiving signal from the down converter (DQD) and decimating the signal according to Nyquist criteria.

Regarding **claim 11**, In FIG. 1, Womack et al. provides an ADC, the element 49, to convert the full-band analog signal received from the antenna, and sampled it according to the Nyquist criteria.

Regarding **claims 20 & 21**, In FIG. 4 elements 411, column 5 lines 15-20 and lines 35-40, Womack et al. discloses comprising the step of decimating successively the narrow band channels to a sample rate twice the symbol rate according to the Nyquist criteria.

Regarding **claim 22**, In FIG. 1, Womack et al. teaches a ADC receiving the full-band analog signal from the antenna, sampling the data according to the Nyquist criteria, and providing the sampled data to the converters and decimators, the elements 411. The number of ADCs (here is one) is fewer than the number of channels in the band selected by multiple digital converters (column 5 lines 35-40).

Art Unit: 2637

7. Claims 4-6 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Womack et al. (US Patent 5,982,819) in view of Ivo et al. (DSP and digital down conversion Proceeding of the Radioelectroniak 99) as applied to claims 2 and 12 above, and further in view of Thacker (US Patent 6,011,548).

Regarding **claims 4 & 15**, further Thacker teaches the DOCSIS for variable length packet (column 1 lines 30-50, line 63-column 2 line 5), as Womack et al.'s system receiving messaging from the antenna with multiple bands in the entire band, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Womack et al.'s digital converters to select channels according to the DOCSIS signal taught by Thacker for the purpose to have a front end compatible to the DOCSIS system in the market using the scheme based on variable-length packet (column 1 lines 30-40, line 65-column 2 line 1).

Regarding **claims 5-6 & 16-17**, the modified Womack et al.'s digital converter with Thacker's teaching is configured to down-convert and decimate a DOCSIS data stream following the DOCSIS standard that the signals of the data stream within non-overlapping channels assigned within a 5 to 42 MHz band and no-overlapping channels are assigned bandwidths of approximately 3.2MHz, 1.6 MHz, .8 MHz, .4 MHz, or .2 MHz as recited in the claims (stated in the specification of the current application: page 11 lines 19-25).

8. Claims 7-10 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Womack et al. (US Patent 5,982,819) in view of Ivo et al. (DSP and digital down conversion Proceeding of the Radioelectroniak 99) as applied to claims 1 and 12 above, and further in view of Tourtier et al. (US Patent 5,446,495).

Art Unit: 2637

Regarding **claims 7-10 and 18-19**, further Tourtier et al. teaches a tree-structure of band splitting in FIG.7 to convert and decimate the channels in the frequency band repeatedly to the baseband for quantisation circuits 28 (column 7 lines 20-30). The SB performs decimating (column 7 lines 19-25) wherein the band of original data is down converted to sub-bands on lines 1 and 3 by SB 26, then the data on line 1 is down converted to sub-bands 5, 6, and 7 by SB 27, and data on line 3 (bands 1, 2,3) is further down converted, hence the down converting as shown in FIG.7 is in the tree hierarchy. It is well known in the Home Audio/Video Interoperability (HAVi) architecture that the DVD, HDTV, etc, are communicating via the messaging system. As Womack et al.'s messaging system receiving signals from PMUs (elements 113 in FIG.1) which can be a wide range of devices such as the HDTV, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to arrange Womack et al.'s modified digital converters with Ivo's teaching (elements 411 in FIG.4) in a tree structure taught by Tourtier et al. for the purpose to down convert the video signals with different formats in different frequency bands simply and efficiently and be able to process the signals independently (column 3 lines 30-35, lines 40-50).

Conclusion

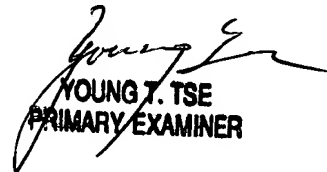
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

Art Unit: 2637

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
September 14, 2004


YOUNG T. TSE
PRIMARY EXAMINER